FIG. 1

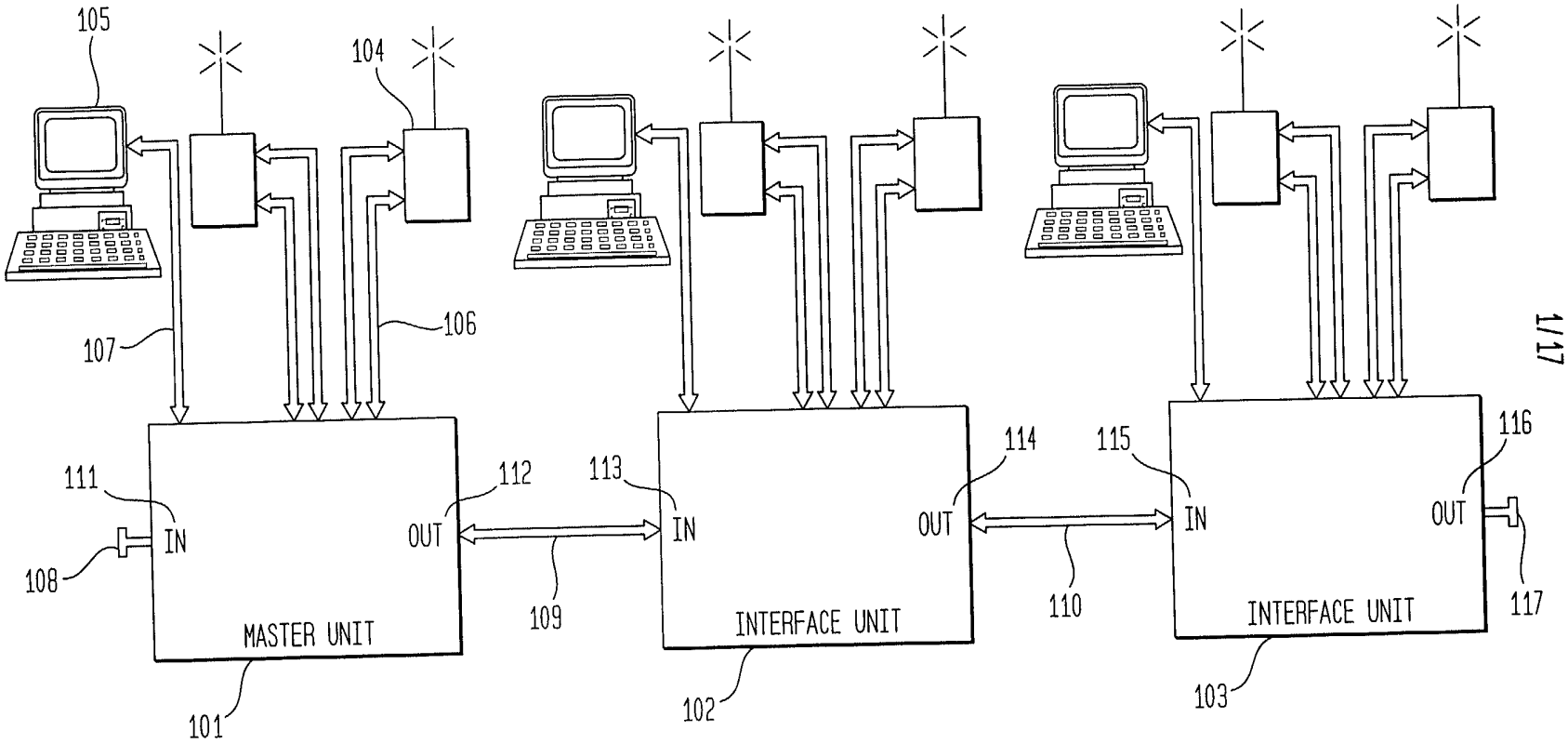

105
104
107
106
111
IN
108
112
OUT
MASTER UNIT
101
109
113
IN
OUT
114
INTERFACE UNIT
102
110
115
IN
OUT
116
INTERFACE UNIT
103
117

FIG. 2

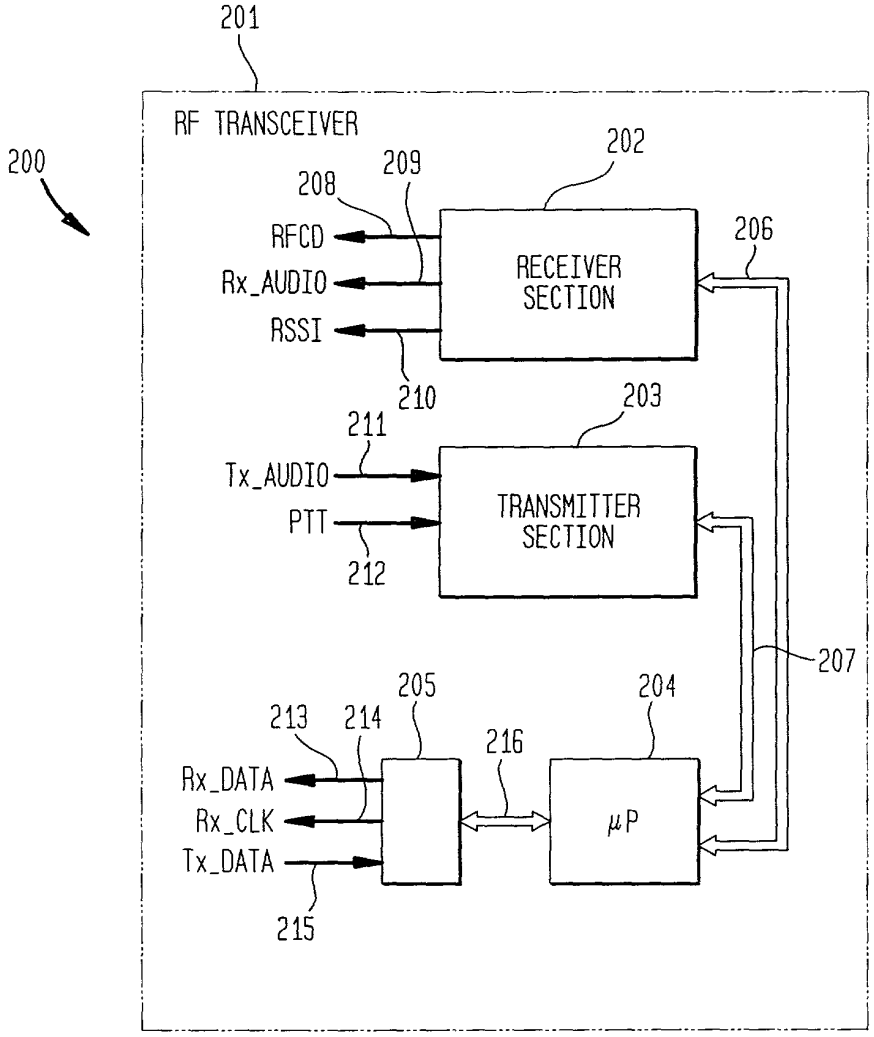
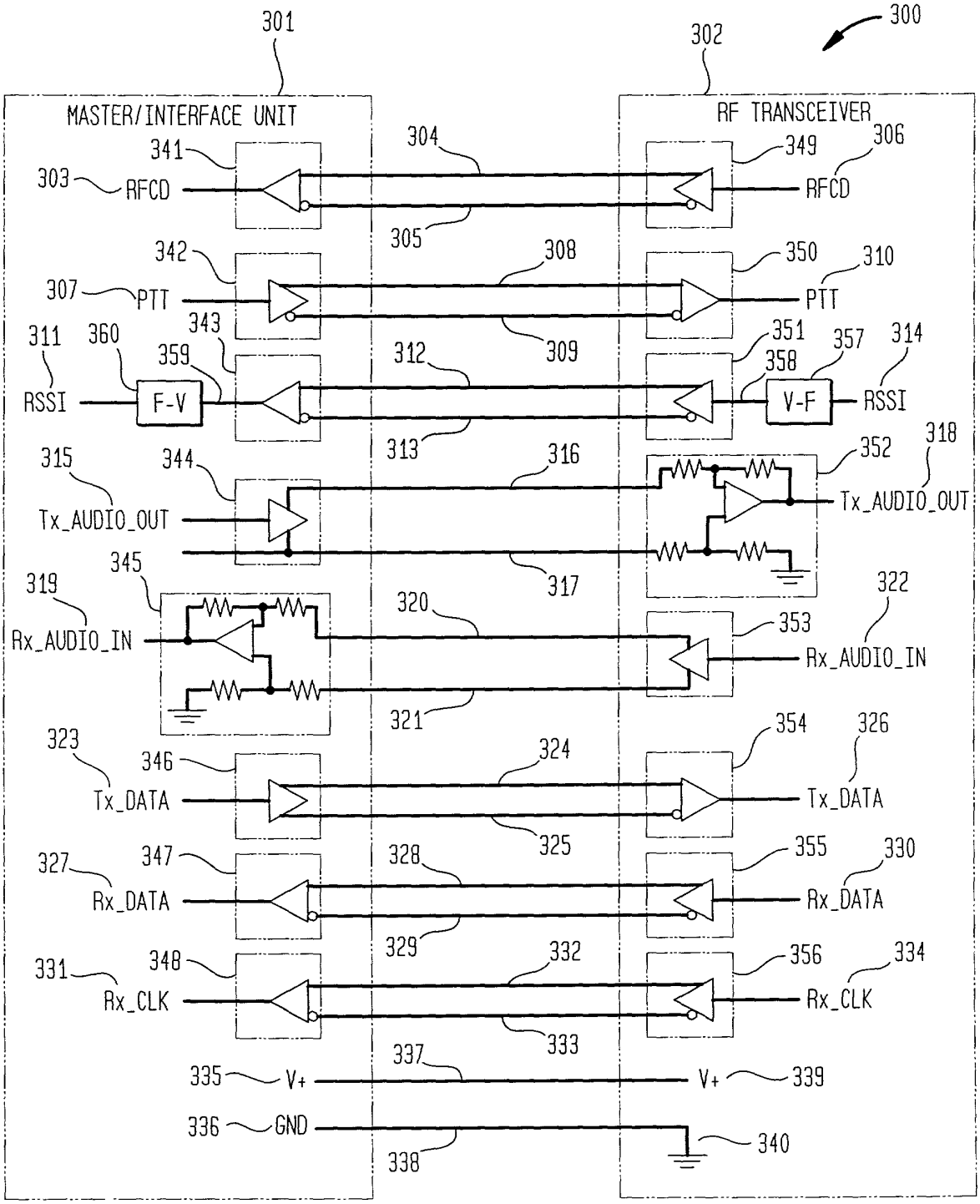

201
RF TRANSCEIVER
200
202
208
209
206
RFCD
Rx_AUDIO
RSSI
RECEIVER SECTION
210
203
211
Tx_AUDIO
PTT
TRANSMITTER SECTION
212
207
205
204
213
214
216
Rx_DATA
Rx_CLK
Tx_DATA
μP
215

FIG. 3


300
301
302
MASTER/INTERFACE UNIT
RF TRANSCEIVER
303
RFCD
304
305
306
RFCD
307
PTT
308
309
310
PTT
311
RSSI
360
F-V
359
312
313
314
V-F
RSSI
315
Tx_AUDIO_OUT
316
317
318
Tx_AUDIO_OUT
319
Rx_AUDIO_IN
320
321
322
Rx_AUDIO_IN
323
Tx_DATA
324
325
326
Tx_DATA
327
Rx_DATA
328
329
330
Rx_DATA
331
Rx_CLK
332
333
334
Rx_CLK
335
V+
337
V+
339
336
GND
338
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358

SUBSTITUTE SHEET

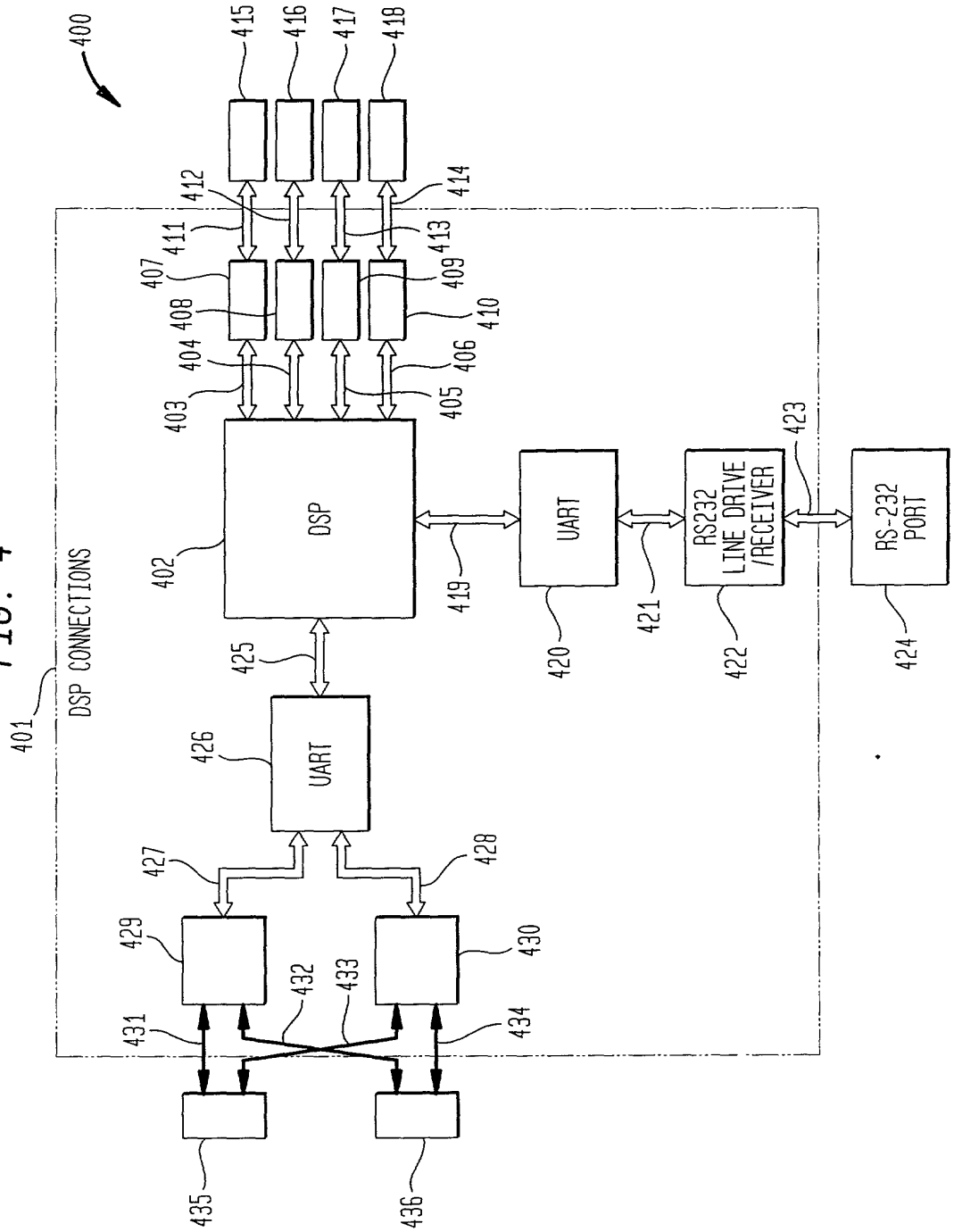


FIG. 4

FIG. 5

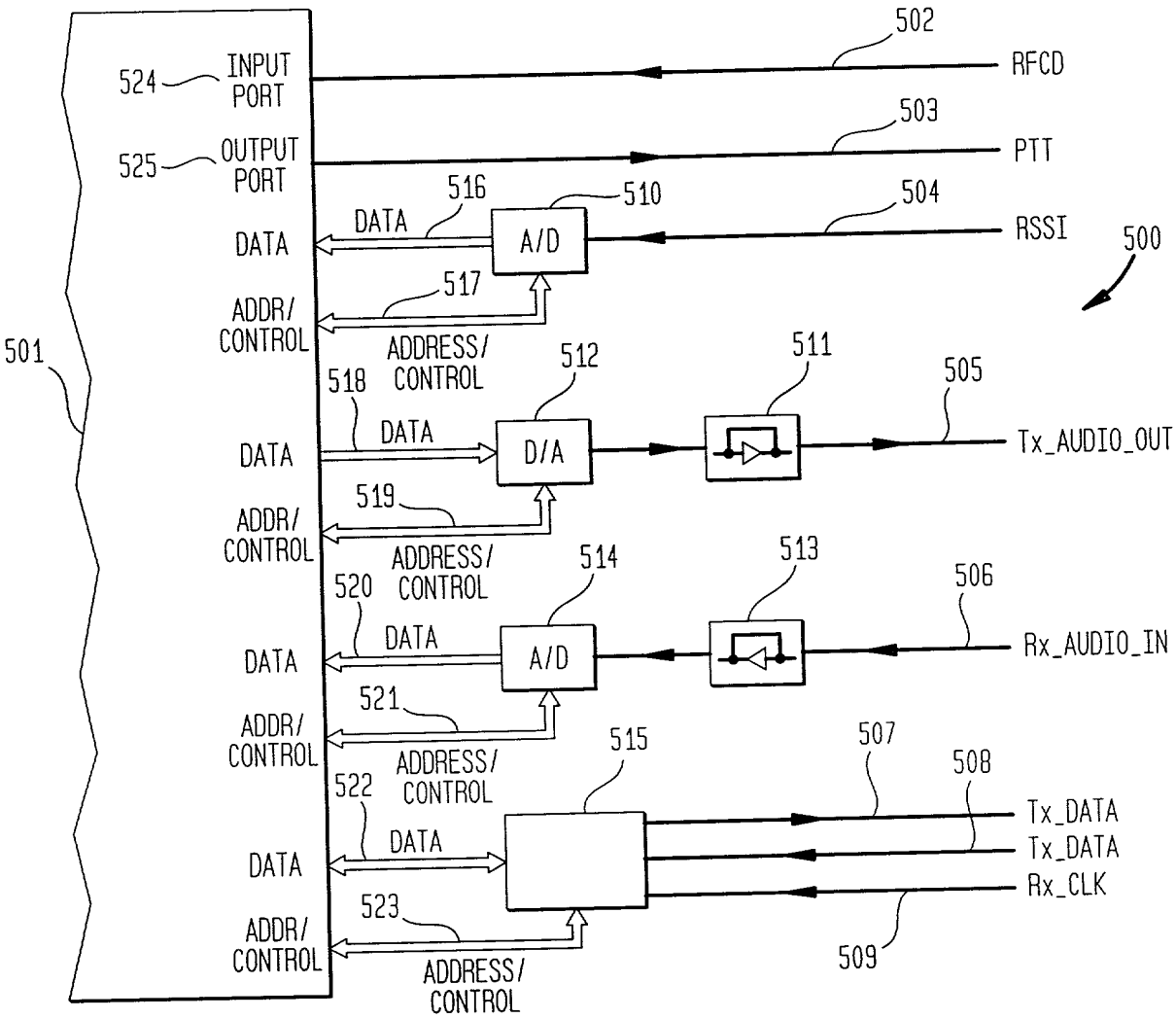
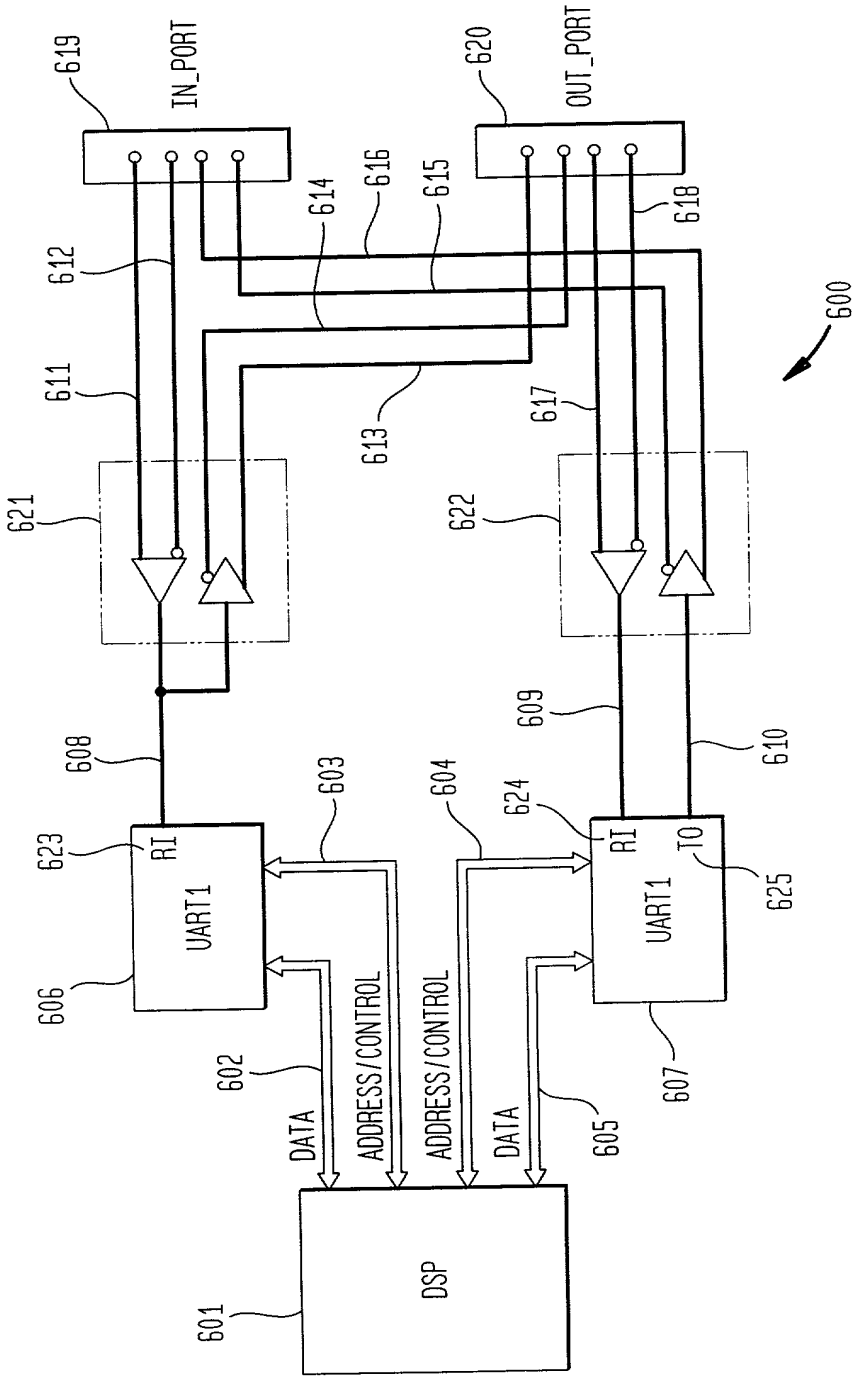
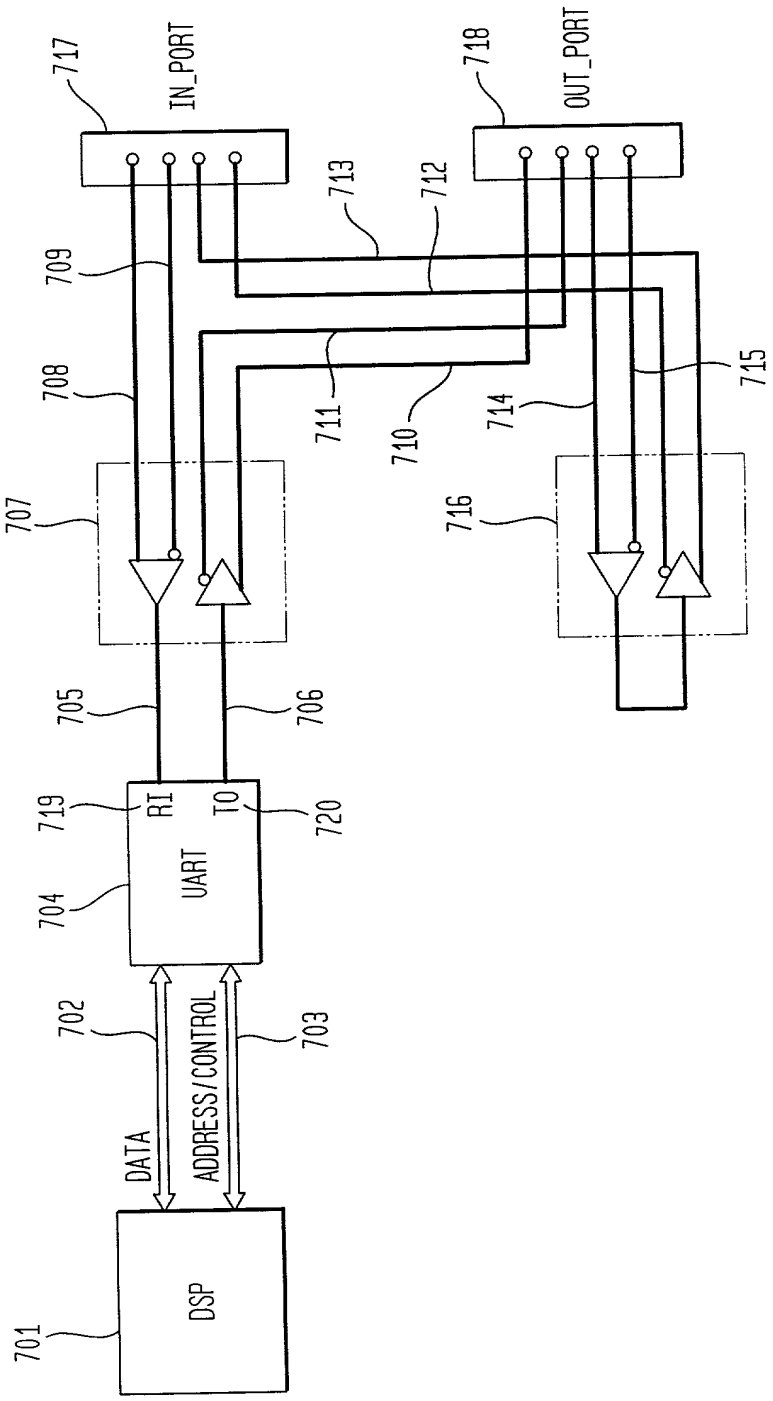

502
RFCD
524
INPUT PORT
503
PTT
525
OUTPUT PORT
516
510
504
DATA
A/D
RSSI
500
DATA
517
ADDR/ CONTROL
501
ADDRESS/ CONTROL
512
511
505
518
DATA
D/A
Tx_AUDIO_OUT
DATA
519
ADDR/ CONTROL
ADDRESS/ CONTROL
514
513
506
520
DATA
A/D
Rx_AUDIO_IN
DATA
521
ADDR/ CONTROL
ADDRESS/ CONTROL
515
507
508
522
DATA
Tx_DATA
Tx_DATA
DATA
Rx_CLK
523
ADDR/ CONTROL
509
ADDRESS/ CONTROL

FIG. 6


600
601
DSP
602
DATA
ADDRESS/CONTROL
603
604
ADDRESS/CONTROL
DATA
605
606
UART1
607
UART1
608
609
610
611
612
613
614
615
616
617
618
619
IN_PORT
620
OUT_PORT
621
622
623
RI
624
RI
TO
625

SUBSTITUTE SHEET (RULE 26)

FIG. 7



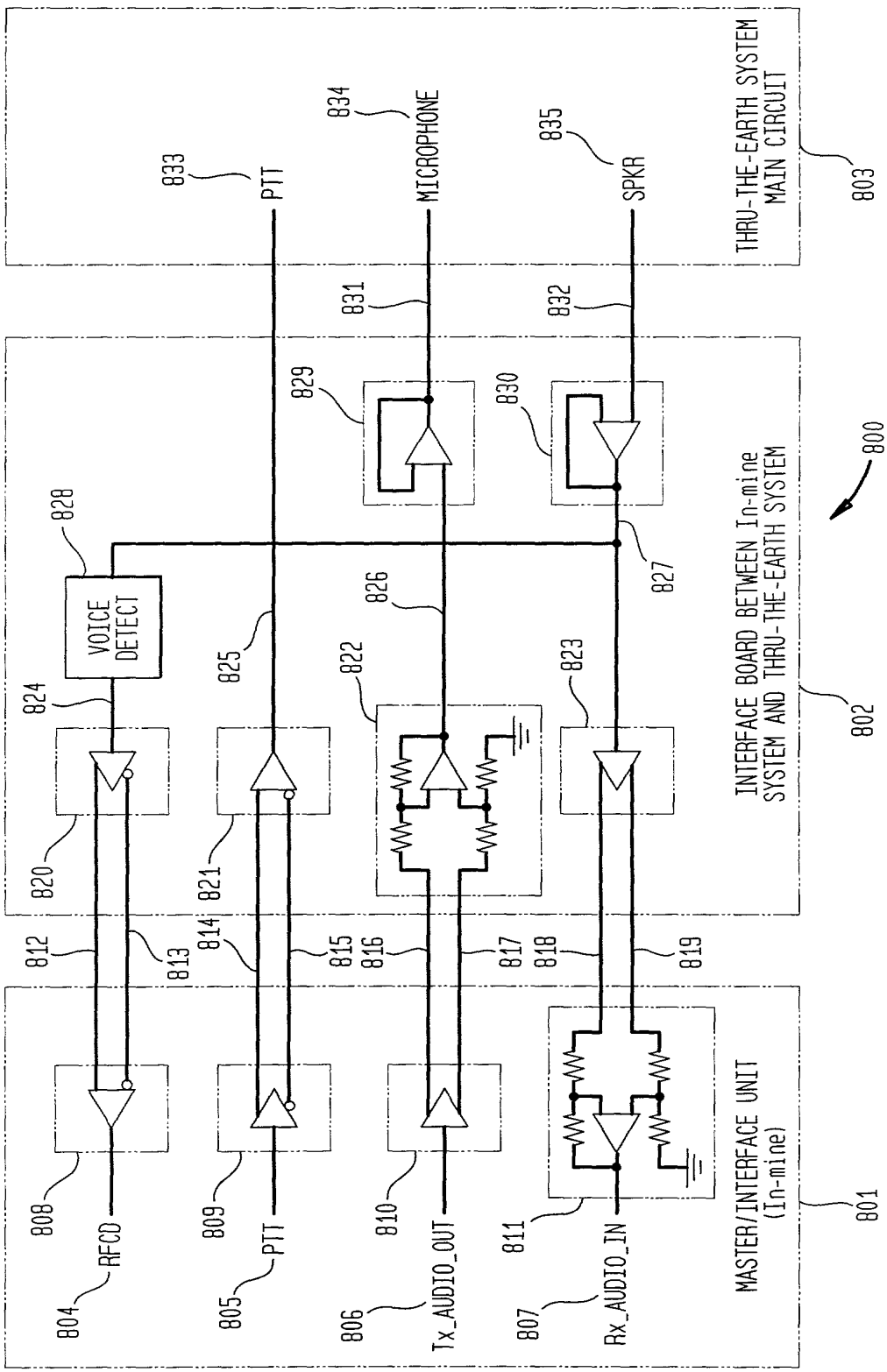
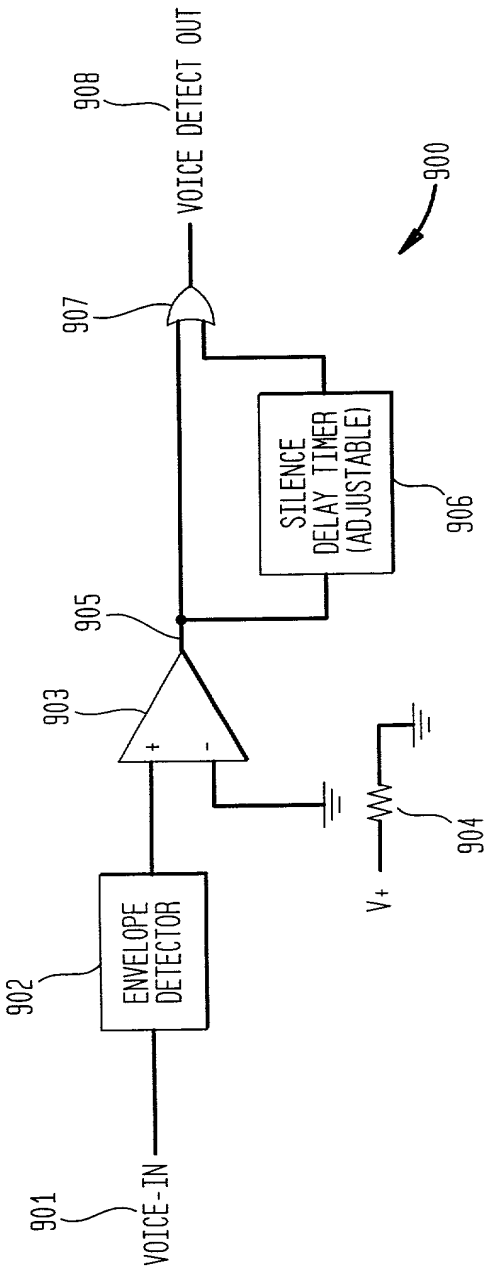

THRU-THE-EARTH SYSTEM MAIN CIRCUIT
803
833
PTT
834
MICROPHONE
835
SPKR
831
832
829
830
828
827
826
825
822
823
824
VOICE DETECT
INTERFACE BOARD BETWEEN In-mine SYSTEM AND THRU-THE-EARTH SYSTEM
802
800
820
821
812
813
814
815
816
817
818
819
808
809
810
811
MASTER/INTERFACE UNIT (In-mine)
801
804
RFCD
805
PTT
806
Tx_AUDIO_OUT
807
Rx_AUDIO_IN

FIG. 8

FIG. 9


900
901
VOICE-IN
902
ENVELOPE DETECTOR
903
+
-
904
V+
905
906
SILENCE DELAY TIMER (ADJUSTABLE)
907
908
VOICE DETECT OUT

20111D"2066h00t

FIG. 10

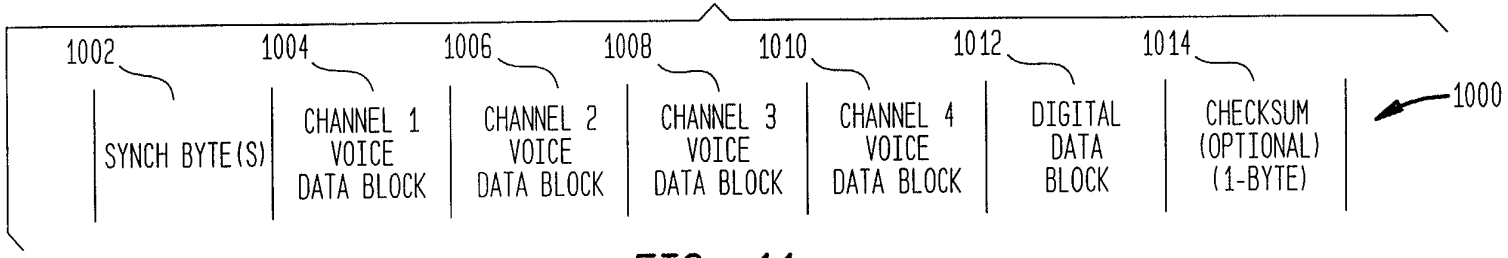


FIG. 11

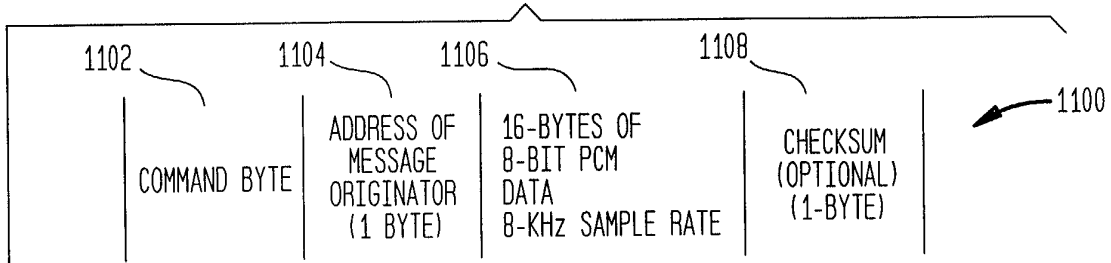


FIG. 12

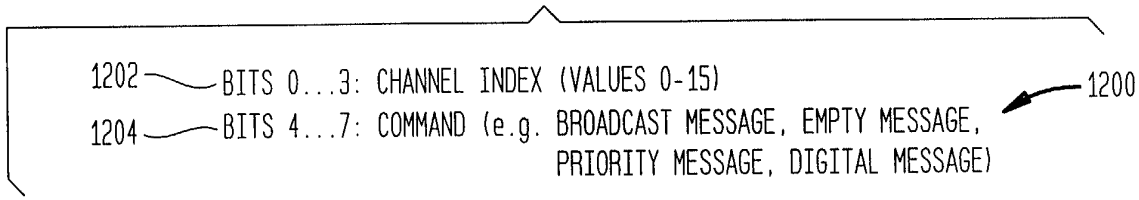


FIG. 13

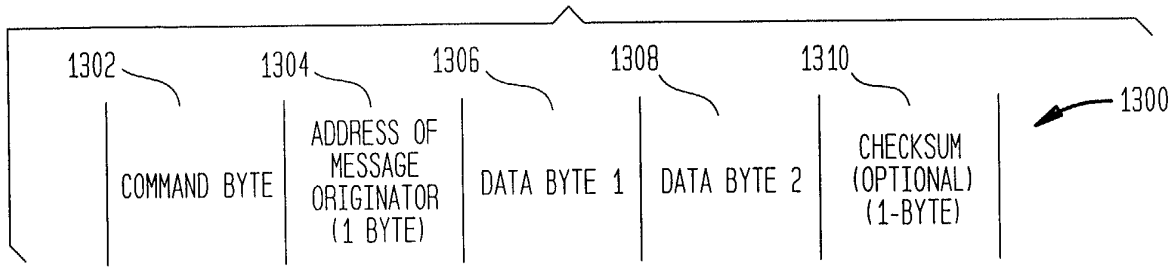


FIG. 14

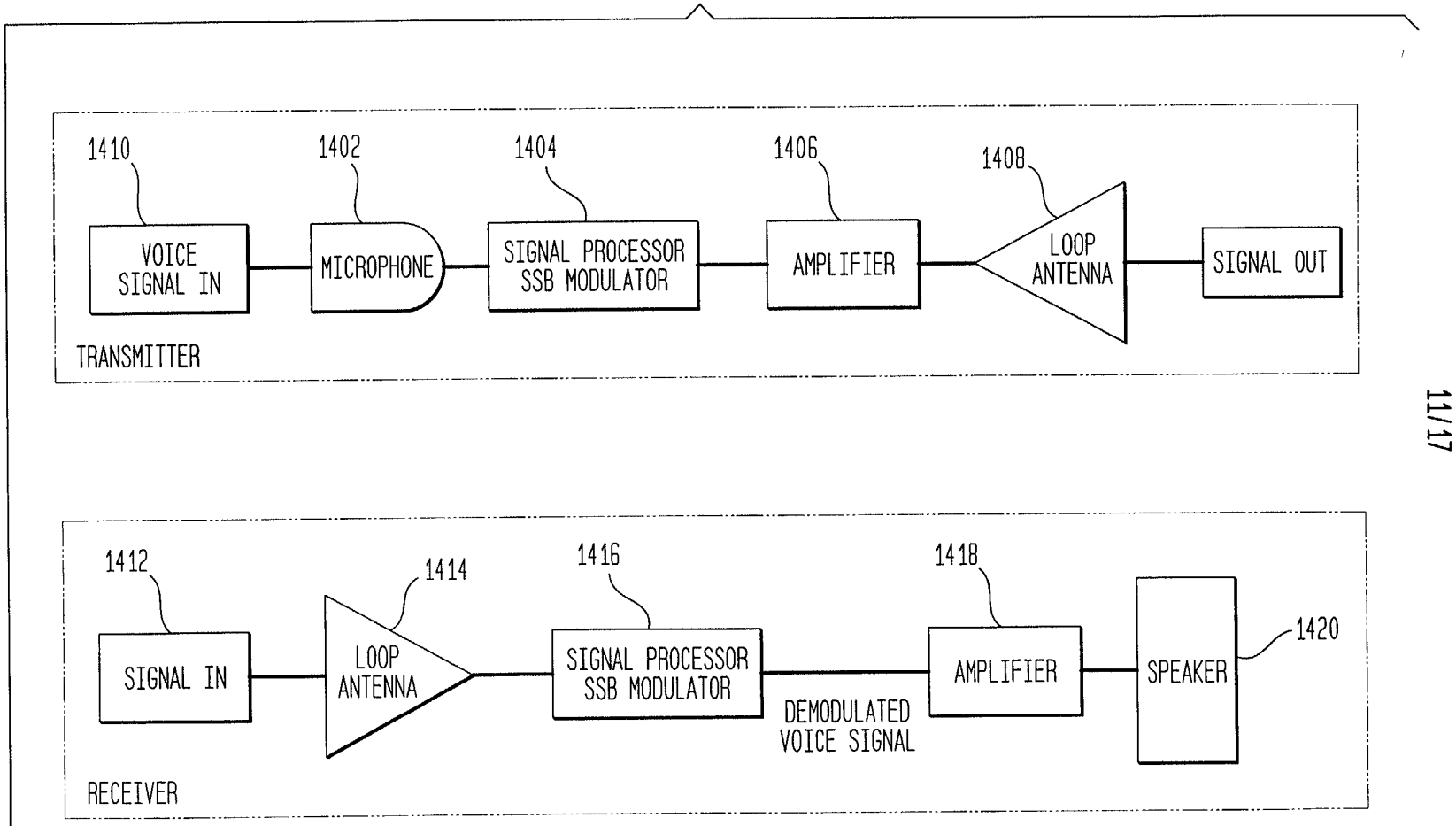

1410
VOICE SIGNAL IN
1402
MICROPHONE
1404
SIGNAL PROCESSOR SSB MODULATOR
1406
AMPLIFIER
1408
LOOP ANTENNA
SIGNAL OUT
TRANSMITTER
1412
SIGNAL IN
1414
LOOP ANTENNA
1416
SIGNAL PROCESSOR SSB MODULATOR
DEMODULATED VOICE SIGNAL
1418
AMPLIFIER
SPEAKER
1420
RECEIVER

FIG. 15

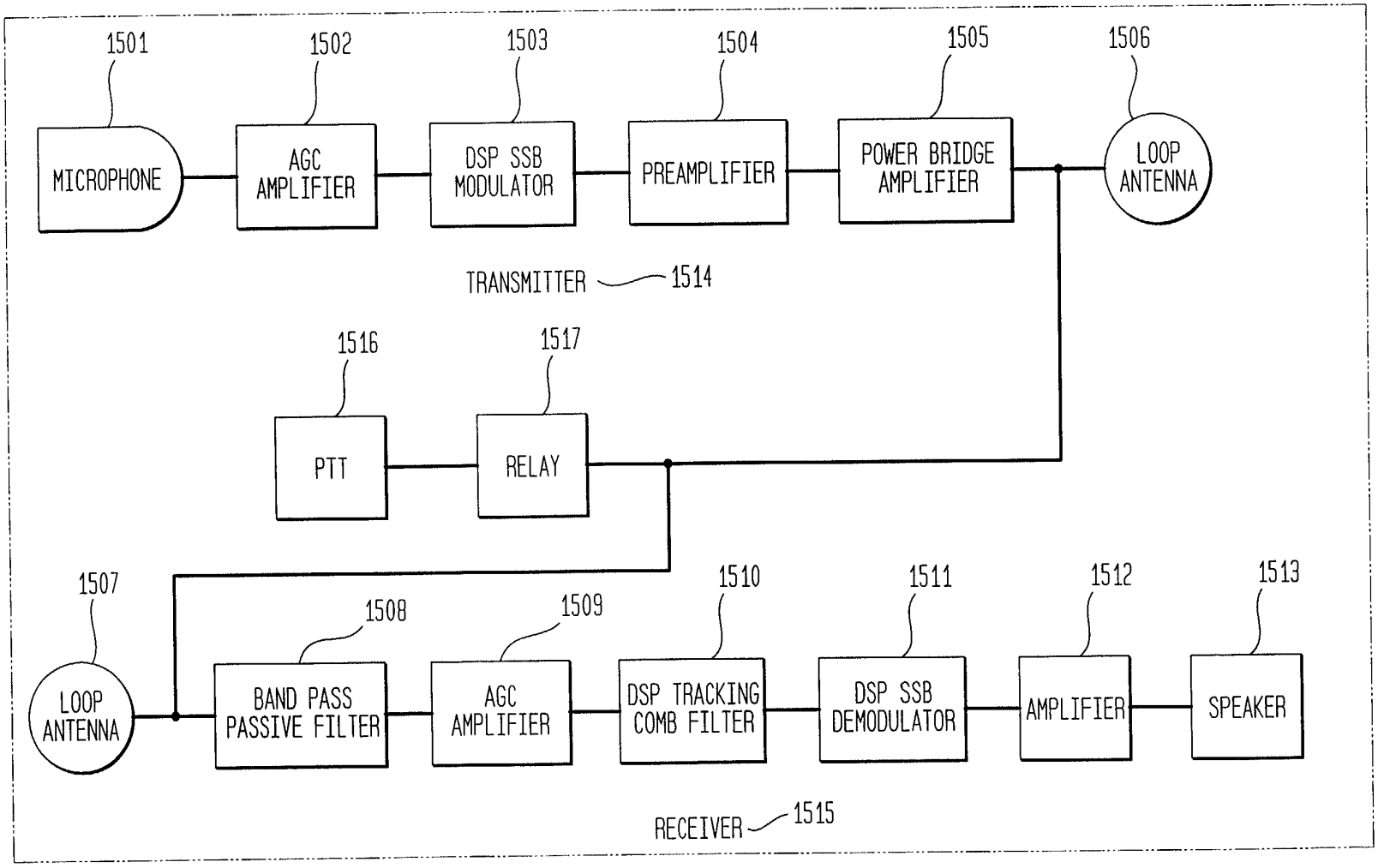

1501
1502
1503
1504
1505
1506
MICROPHONE
AGC AMPLIFIER
DSP SSB MODULATOR
PREAMPLIFIER
POWER BRIDGE AMPLIFIER
LOOP ANTENNA
TRANSMITTER
1514
1516
1517
PTT
RELAY
1507
1508
1509
1510
1511
1512
1513
LOOP ANTENNA
BAND PASS PASSIVE FILTER
AGC AMPLIFIER
DSP TRACKING COMB FILTER
DSP SSB DEMODULATOR
AMPLIFIER
SPEAKER
RECEIVER
1515

FIG. 16

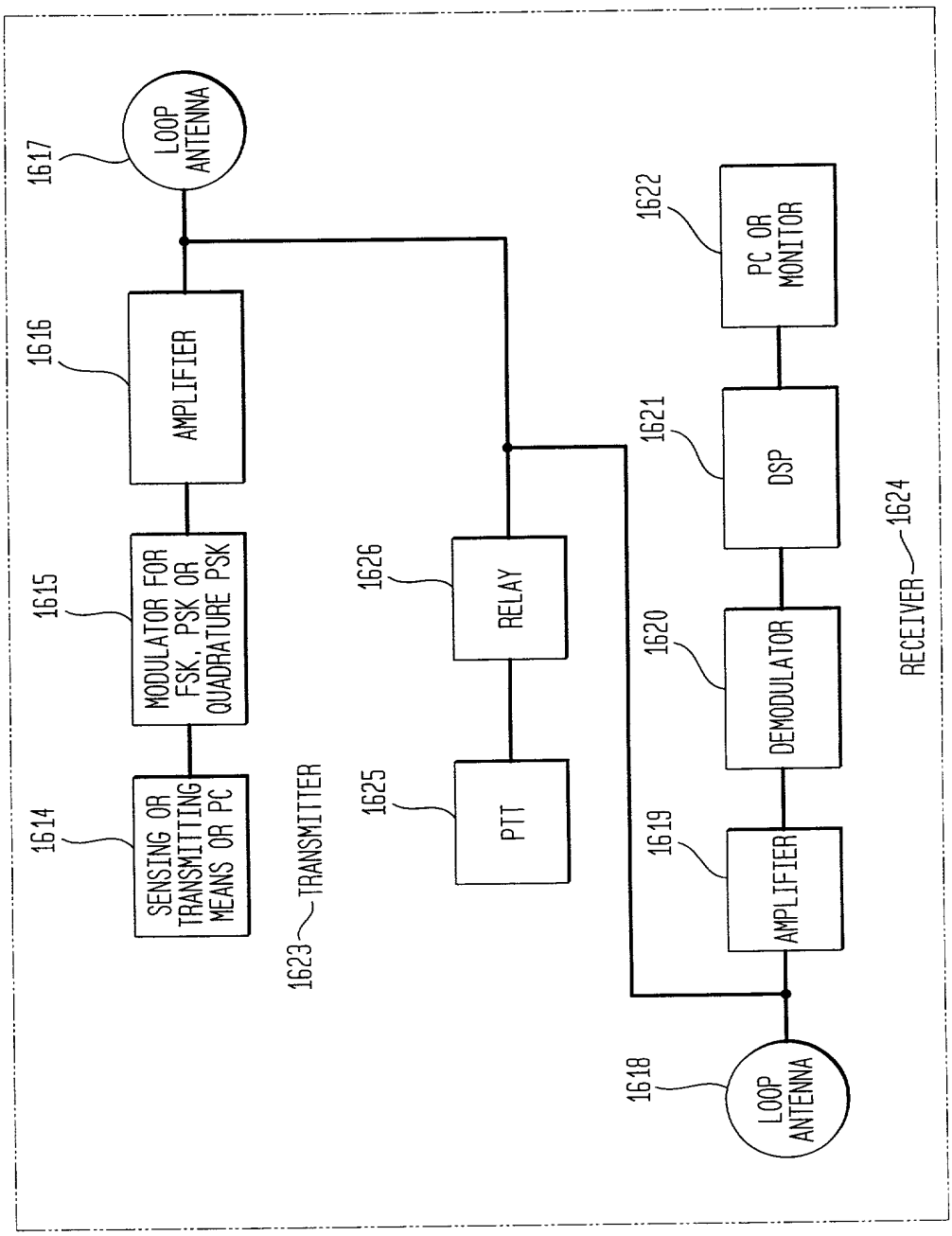

1617
LOOP ANTENNA
1616
AMPLIFIER
1615
MODULATOR FOR FSK, PSK OR QUADRATURE PSK
1614
SENSING OR TRANSMITTING MEANS OR PC
1623
TRANSMITTER
1626
RELAY
1625
PTT
1622
PC OR MONITOR
1621
DSP
1620
DEMODULATOR
1619
AMPLIFIER
1618
LOOP ANTENNA
1624
RECEIVER

FIG. 17

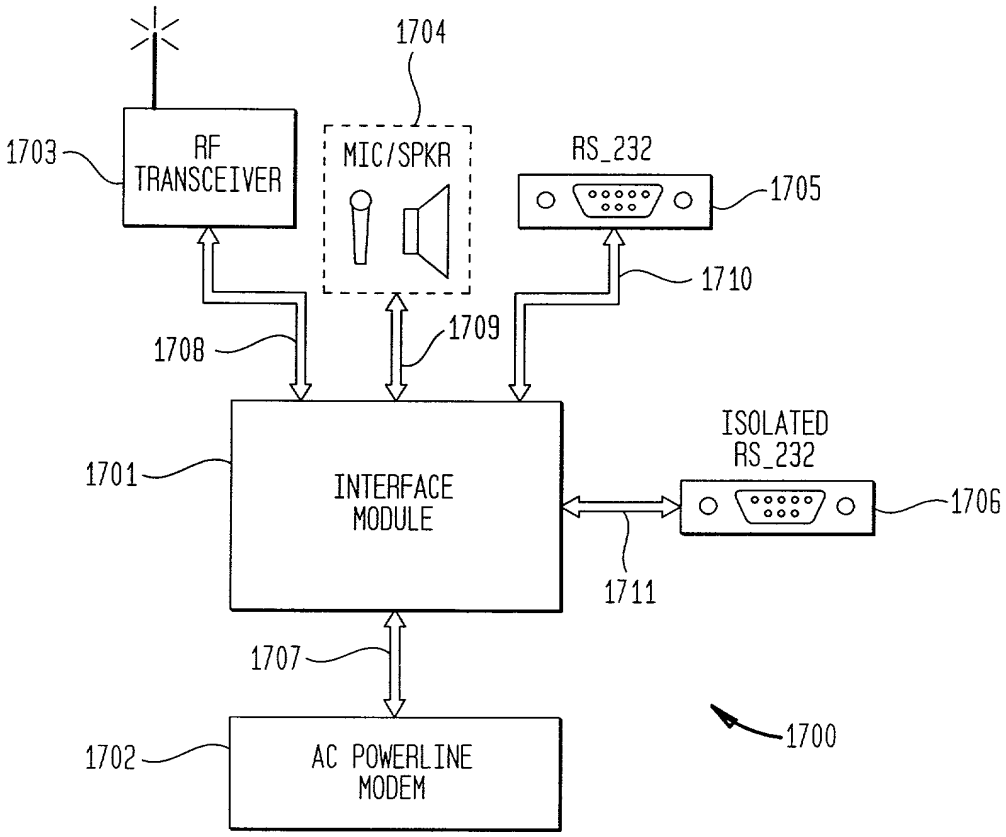

1704
1703
RF TRANSCEIVER
MIC/SPKR
RS_232
1705
1710
1708
1709
1701
INTERFACE MODULE
ISOLATED RS_232
1706
1711
1707
1700
1702
AC POWERLINE MODEM

FIG. 18

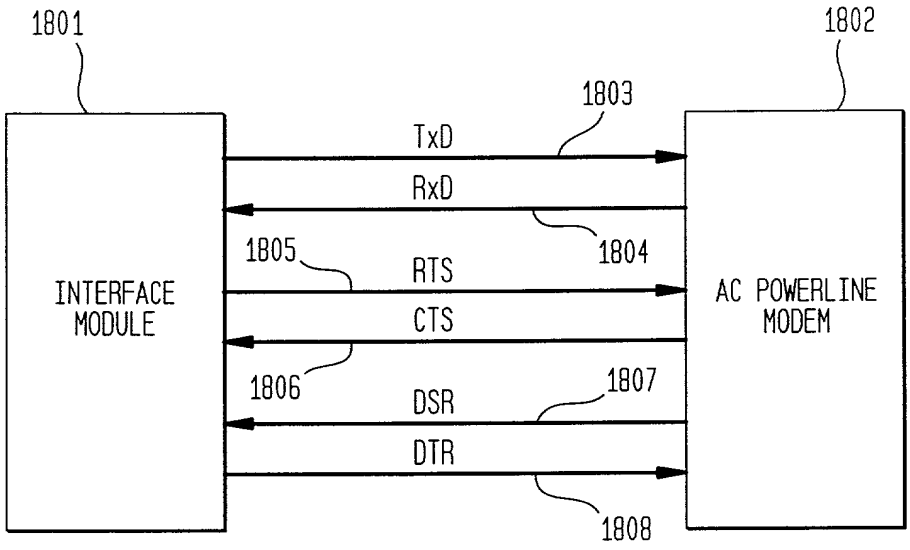


EXHIBIT 1008 - Page 1008 of 1073

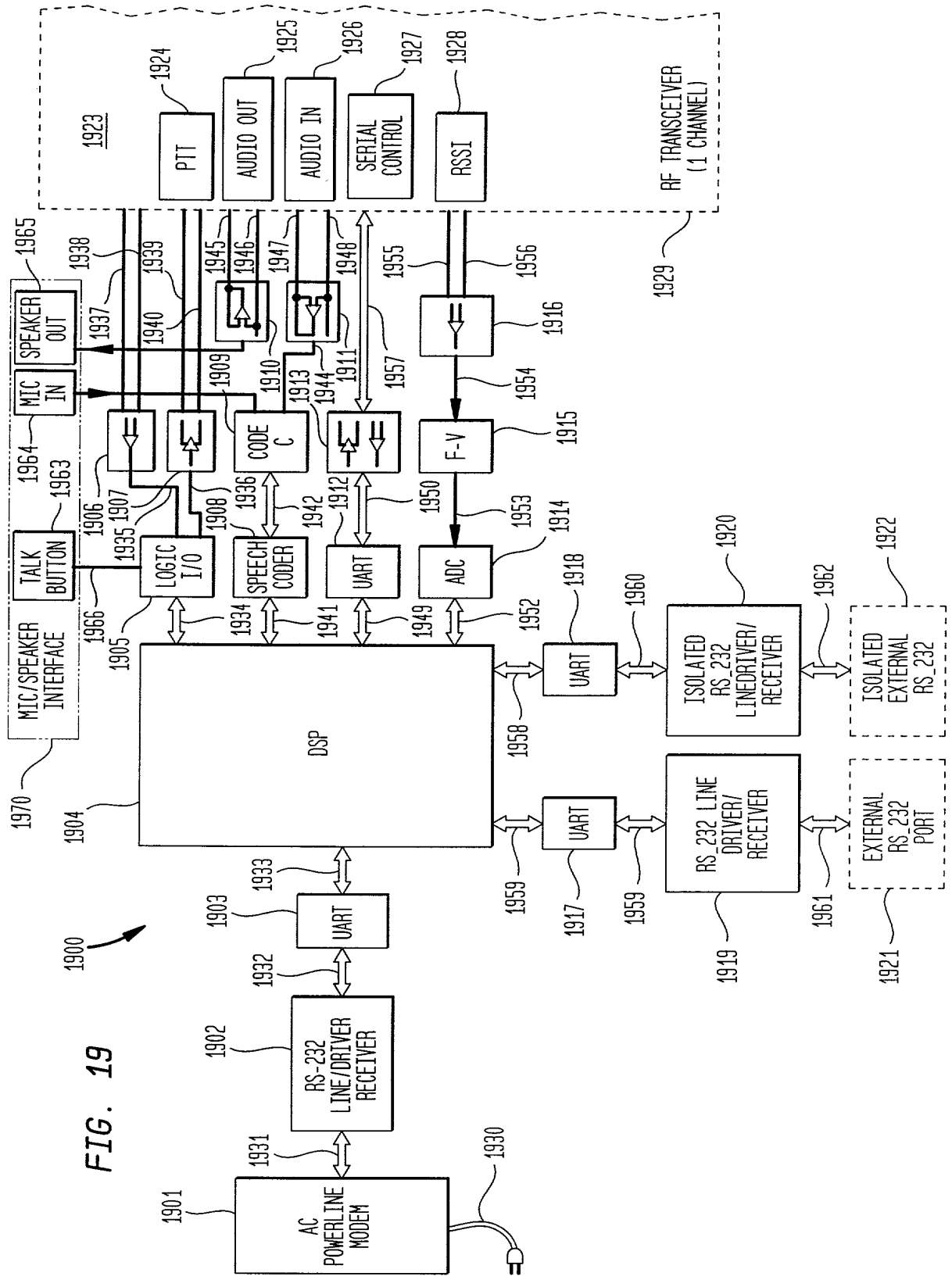

1923
PTT
AUDIO OUT
AUDIO IN
SERIAL CONTROL
RSSI
RF TRANSCEIVER (1 CHANNEL)
1929
SPEAKER OUT
MIC IN
TALK BUTTON
MIC/SPEAKER INTERFACE
1970
LOGIC I/O
CODEC
SPEECH CODER
UART
ADC
F-V
DSP
1904
UART
UART
UART
ISOLATED RS_232 LINEDRIVER/ RECEIVER
ISOLATED EXTERNAL RS_232
RS_232 LINE DRIVER/ RECEIVER
EXTERNAL RS_232 PORT
UART
RS-232 LINE/DRIVER RECEIVER
AC POWERLINE MODEM
1900
FIG. 19

FIG. 20

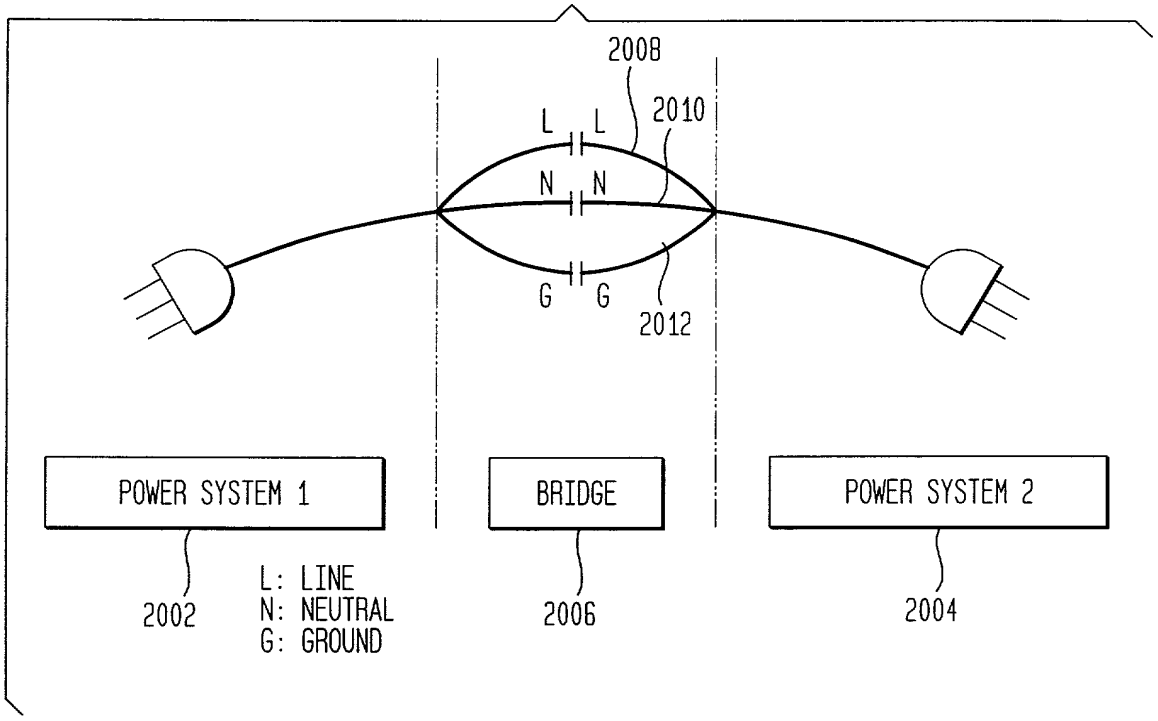
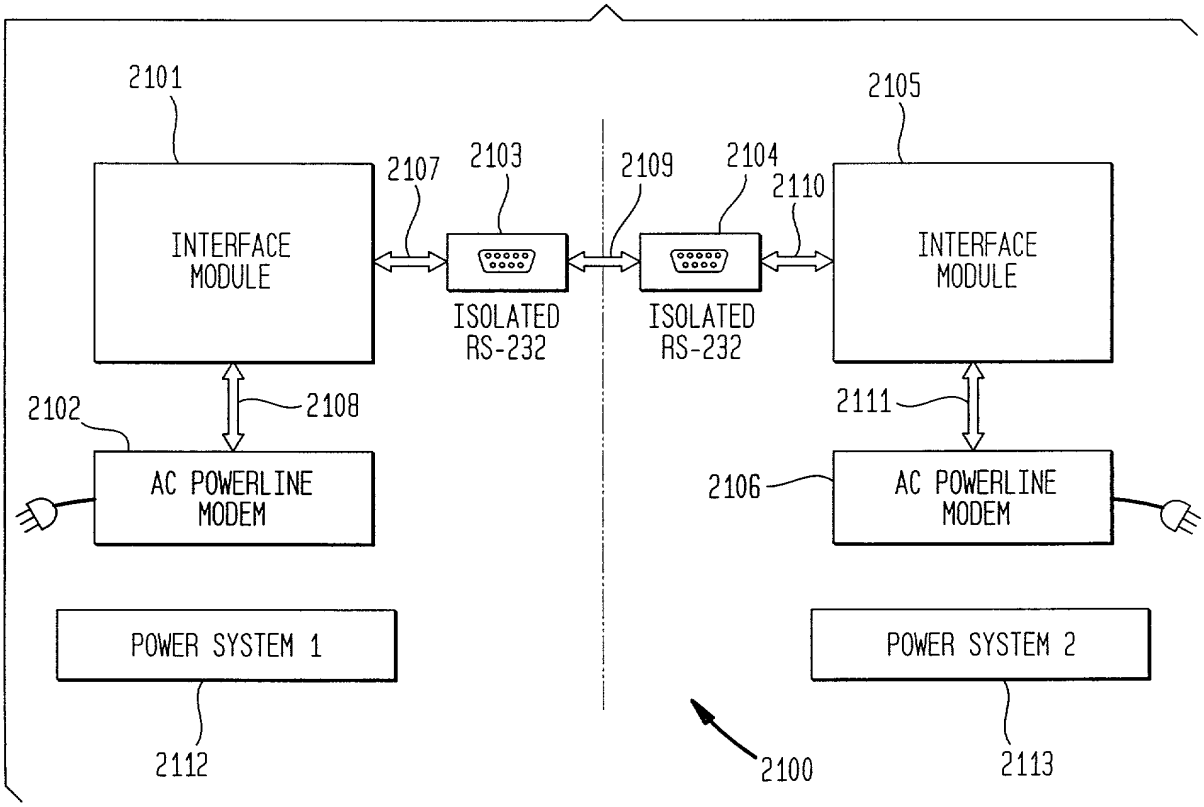

2008
2010
L L
N N
G G
2012
POWER SYSTEM 1
BRIDGE
POWER SYSTEM 2
2002
L: LINE
N: NEUTRAL
G: GROUND
2006
2004

FIG. 21


2101
2105
2107
2103
2109
2104
2110
INTERFACE MODULE
INTERFACE MODULE
ISOLATED RS-232
ISOLATED RS-232
2102
2108
2111
AC POWERLINE MODEM
2106
AC POWERLINE MODEM
POWER SYSTEM 1
POWER SYSTEM 2
2112
2100
2113